to say a total of 18 to 30 per cent, on to the weight of the charge. With a Pernot furnace, about sixteen charges of 5 to 6 tons may be produced in twenty-four hours. It further says: —

"I never melt the pig-iron which is to be cleaned in the cleaning-furnace itself as is done generally in the puddling process. The reason why I proceed in another way lies in the quickness with which the reactions of the oxides upon phosphorus, etc., are performed, so that if I should melt the pig iron in the cleaning furnace itself, the first molten part would be refined and already decarbonised to a high degree before the last part of the pig iron is melted."

After describing the manner in which the hearth is prepared and the charging of the ores required for reaction and causing these to adhere to the bottom walls of the hearth, and that the charge is then run upon them into the hearth, the specification goes on to say : —

" In proceeding thus there is not much ore torn off mechanically from bottom and walls, but the cast-iron charge dissolves for itself as much of the oxides as it needs for its purification, the oxides being obliged to pass gradually as they melt through the cast iron. By these means I cause the reaction not to develop in a too rapid and explosive manner, so that the metal does not run over the walls of the hearth or is not thrown out. All -these inconveniences would take place if I introduced the oxides in the molten state at the same time as or before the cast iron, and by proceeding in the latter manner, it would not be possible to treat large quantities at once, neither to maintain a regular and economic working."

The process has been employed with success for several years in America, and large quantities of low phosphorous iron (washed metal) manufactured thereby. It has furnished proof that phosphorus also, as well as Si and Mn, that is to say, the agents with exothermic reactions, can be eliminated before carbon. Of course, in the Krupp process, temperatures rule which may not be allowed to considerably exceed 1200°.

Recently estimates have become available as to the behaviour of the agents at higher temperatures.

Ledebur gives in " Stabl und EJisen/' 1903, p. 40? examples